Appendix B:

Electronic/Automated Software Systems -- Work Breakdown Structure and Definitions

B.1 -- Scope

This appendix provides the electronic/automated software system work breakdown structure. Definitions for the prime mission product (PMP) and platform integration are provided in this appendix. Definitions for WBS elements common to all defense materiel items are given in Appendix H: Work Breakdown Structure Definitions, Common Elements.

B.2 -- Applicable Documents

The following standards form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation.

Standards

MIL-STD-196, *Joint Electronics Type Designation System*
MIL-STD-498, *Software Development and Documentation*
MIL-STD-1464, *Army Nomenclature System*
MIL-STD-1661, *Mark and Mod Nomenclature System*
MIL-STD-1812, *Type Designation, Assignment and Method for Obtaining*

Unless otherwise indicated, copies of federal and military specifications, standards, and handbooks are available from the

Standardization Documents Order Desk
700 Robbins Avenue
Building #4, Section D
Philadelphia, PA 19111-5094

Non-Government Publications

The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of the documents which are DoD adopted are those listed in the issue of the DoDISS cited in the solicitation. Unless otherwise specified, the issues of documents not listed in the DoDISS are the issues of the documents cited in the solicitation.

American National Standards Institute (ANSI)

ANSI/IEEE STD 610.12, *Standard Glossary of Software Engineering Terminology*

(Application for copies should be addressed to ANSI Customer Service, 11 West 42nd Street, New York, NY 10036.)

B.3 -- Work Breakdown Structure Levels

Level 1	Level 2	Level 3
Electronic/Automated Software System	Prime Mission Product (PMP)	Subsystem 1..n (Specify Names) PMP Applications Software PMP System Software Integration, Assembly, Test and Checkout
	Platform Integration	
	Systems Engineering/ Program Management	
	System Test and Evaluation	Development Test and Evaluation Operational Test and Evaluation Mock-ups Test and Evaluation Support Test Facilities
	Training	Equipment Services Facilities
	Data	Technical Publications Engineering Data Management Data Support Data Data Depository
	Peculiar Support Equipment	Test and Measurement Equipment Support and Handling Equipment
	Common Support Equipment	Test and Measurement Equipment Support and Handling Equipment
	Operational/Site Activation	System Assembly, Installation and Checkout on Site Contractor Technical Support Site Construction Site/Ship/Vehicle Conversion
	Industrial Facilities	Construction/Conversion/Expansion Equipment Acquisition or Modernization Maintenance (Industrial Facilities)
	Initial Spares and Repair Parts	

Parts

B.4 -- Definitions

B.4.1 -- Electronic/Automated Software System

The complex of equipment (hardware/software), data, services, and facilities required to develop and produce an electronic, automated, or software system capability such as a command and control system, radar system, communications system, information system, sensor system, navigation/guidance system, electronic warfare system, support system, etc.

> *Note:* ***To differentiate between the Electronic/Automated Software System category and other defense materiel item categories, use the following rule:***
>
> ***When the item is a stand-alone system or used on several systems but not accounted for within the system, use the Electronic/Automated Software System category.***

> *Note:* ***When the opportunity to collect lower level information on electronic and software items exists, regardless of which defense materiel item category is selected, the structure and definitions in this appendix apply.***

B.4.2 -- Prime Mission Product (PMP)

The hardware and software used to accomplish the primary mission of the defense materiel item.

Includes, for example:

- all integration, assembly, test and checkout, as well as all technical and management activities associated with individual hardware/software elements

- integration, assembly, test and checkout associated with the overall PMP. When the electronic/automated software system comprises several PMPs, each will be listed separately at level 2

- all whole and partial prime contractor, subcontractor, and vendor breadboards, brassboards, and qualification test units

- the design, development and production of complete units (i.e., the prototype or operationally configured units which satisfy the requirements of their applicable specification(s), regardless of end use)

- factory special test equipment, special tooling, and production planning required to fabricate the PMP

Excludes:

- only those "less than whole" units (e.g., test, spares, etc.) consumed or planned to be consumed in support of system level tests

- duplicate or modified factory special test equipment delivered to the government for depot repair (should be included in the peculiar support equipment element)

B.4.2.1 -- Subsystem 1..n (Specify Names)

The hardware and software components of the specific electronic/automated software subsystem.

Includes, for example:

- all associated special test equipment, special tooling, production planning, and all technical and management activities

- the software components, consisting of the applications and system software required to direct and maintain the specific electronic/automated software subsystem

- all in-plant integration, assembly, test, and checkout of hardware components and software into an electronic/automated software subsystem, including the subsystem hardware and software integration and test

- interface materials and parts required for the in-plant integration and assembly of other level 4 components into the electronic/automated software subsystem and all materials and parts or other mating equipments furnished by/to an integrating agency or contractor

- cables, conduits, connectors, shelters, and other devices associated with the operational electronic/automated software subsystem

- the design, development, production, and assembly efforts to provide each electronic/automated software subsystem as an entity

Excludes:

- All effort directly associated with the remaining level 3 WBS elements and the integration, assembly, test and checkout of these elements into the prime mission product

B.4.2.2 -- Prime Mission Product Applications Software

The software that is specifically produced for the functional use of a computer system (ref. ANSI/IEEE Std 610.12).

Includes, for example:

- battle management, weapons control, and data base management

- all effort required to design, develop, integrate, and checkout the PMP applications computer software configuration items (CSCIs), not including the non-software portion of PMP firmware development and production

Excludes:

- all software that is an integral part of any specific hardware subsystem specification

Note: **All software that is an integral part of any specific equipment system and subsystem specification or specifically designed and developed for system test and evaluation should be identified with that system, subsystem, or effort. It may be appropriate to collect lower level information when it exists. In such cases, the following structure and definitions should be used:**

Level 4	Level 5
Build 1..n (Specify names)	CSCI 1..n (Specify names)
	CSCI to CSCI Integration and Checkout
Integration, Assembly, Test and Checkout	

a) ***Build 1..n (Specify names)***

A software build is an aggregate of one or more CSCIs that satisfies a specific set or subset of requirements.

When incremental, spiral, or other software development method is used, multiple builds may be necessary to meet program requirements.

A build is a separately tested and delivered product. Within builds are CSCIs. When a build is complete, a portion or all of one or more CSCIs will be completed. Therefore, a CSCI may appear in more than one build, but will be successively more functional as each build is completed.

b) ***Computer Software Configuration Item (CSCI) 1..n (Specify names)***

An aggregation of software or any of its discrete portions which satisfies an end use function and has been designated by the government for configuration management. CSCIs are the major software products of a system acquisition which are developed in accordance with standard DoD or commercial practices and process.

Includes, for example:

- reusable software components, such as commercial off-the-shelf software, government furnished software, or software specifically developed for reuse

- Computer Software Components (CSCs) which are functionally or logically a distinct part of a CSCI, distinguished for convenience in designing and specifying a complex CSCI as an assembly of subordinate elements

- effort associated with the requirements analysis, design, coding and testing, CSCs integration and testing, CSCI formal qualification testing, and software problem resolution of each CSCI

c) ***CSCI to CSCI Integration and Checkout***

Includes, for example:

- integration and test, verification and validation and the systems engineering and technical control of the CSCIs

- integration and test is the planning, conducting and analysis of tests that verify correct and proper performance of each CSCI operating as a whole with other CSCIs

Planning includes:

- •• defining test scope and objectives

- •• establishing the test approach, acceptance criteria, verification methods, order of integration, inputs, and methods to record results

- •• establishing test locations, schedules, and responsibilities of those involved

Conduct and analysis of tests encompasses:

- •• developing test procedures

- •• preparing test data and expected results

- •• executing the test procedures and recording test results

- •• reducing test results, identifying errors, and preparing test data sheets

- •• reporting results

Note: ***Verification and validation may be accomplished to insure the performance and quality of each CSCI in comparison with other CSCIs.***

Excludes:

•• the software integration and checkout associated with the individual CSCIs

Note: ***The defined software structure for lower level information is appropriate whether it is associated with a specific system or subsystem or considered software intensive or stand alone.***

B.4.2.3 -- Prime Mission Product System Software

The software designed for a specific computer system or family of computer systems to facilitate the operation and maintenance of the computer system and associated programs.

Includes, for example:

• operating systems, compilers, and utilities (ref. ANSI/IEEE Std 610.12)

• all effort required to design, develop, integrate, and checkout the PMP system software including all software developed to support PMP-applications-software development

• PMP system software which is required to facilitate development, integration, and maintenance of any PMP software build and CSCI

Excludes:

• software that is an integral part of any specific hardware subsystem specification or is specifically designed and developed for system test and evaluation

Note: ***The structure shown in paragraph B.4.2.2 should be used when lower level information is desired.***

B.4.2.4 -- Integration, Assembly, Test, and Checkout

The effort as identified in Appendix H: Work Breakdown Structure Definitions, Common Elements to provide a complete PMP system. The integration, assembly, test, and checkout element includes hardware and PMP software integration and test.

B.4.3 -- Platform Integration

WBS Level 2: the effort involved in providing technical and engineering services to the platform manufacturer or integrator during the installation and integration of the PMP into the host vehicle.

Includes, for example:

• the labor required to analyze, design, and develop the interfaces with other host vehicle subsystems

- drawing preparation and establishment of equipment requirements and specifications

- technical liaison and coordination with the military services subcontractors, associated contractors, and test groups

Excludes:

- all integration effort not directly associated with the host vehicle and management liaison with the military services, subcontractors, and associated contractors

B.4.4 -- WBS Common Elements

Definitions for common WBS elements applicable to the electronic/automated software system and all other defense materiel items are in Appendix H: Work Breakdown Structure Definitions, Common Elements.